Heavy-Duty Vehicle Emissions Testing Program—Giving fleet operators access to a convenient mobile testing lab

Heavy-duty vehicles such as trucks and buses play a valuable role in our economy, transporting both people and goods reliably and cost-effectively.

Most heavy-duty vehicles burn standard diesel fuel, which emits respirable particulates, as well as ozone-producing and greenhouse gases. As a result of increasing environmental and health concerns, the Federal and some local governments have initiated stricter emissions standards for heavy-duty vehicles.

To meet these standards, which will become more stringent over time, public and private sector heavy-duty fleet operators are investigating a number of potential solutions. These could include the use of alternative fuels, low sulfur diesel fuel, various fuel additives or a new generation of higher efficiency diesel engines.

Once test vehicles are put into service, fleet operators need a way to measure their emissions performance and compare them to their conventional vehicles. There are currently a handful of testing stations around the country. These stationary sites use technology that necessitates removing the engine from the chassis, and they utilize a lengthy test protocol. In order to perform complete emissions tests on the heavy-duty vehicles, municipalities and companies must have their vehicles out of service for 3-4 days, not including the time it takes to travel to the site.

Bring the testing lab to the vehicle—and save downtime

Responding to this situation, DOE worked with engineers at the Department of Mechanical and Aerospace Engineering at West Virginia University to design and build the world's first transportable engine emissions testing laboratory for monitoring engine and emissions performance. It's a fully mobile facility on two trailer trucks, which can easily pull into any operator's site or convenient central area. Once in position, the bed of one of the trailers is lowered to the ground, and the vehicle to be tested is literally driven over the equipment on the bed and properly positioned. There's little set up and little vehicle preparation time, and a full battery of tests can be performed in less than a day, after which the vehicle can immediately return to normal

service. What's more, for qualified operators, the only "cost" involved with the service of the testing lab and its staff is an agreement to share the data generated.

Simulates driving conditions, screens for all major pollutants

Although the vehicle actually "drives" only on rollers, the testing system is able to simulate most real-world driving conditions that could impact emissions performance. Vehicle load of up to 40,000 pounds can be simulated, as can the effects of wind drag. In addition, the impact of gear shifting is taken into account by giving the driver/operator visual prompts via a computer monitor.

The mobile laboratory can measure particulate emissions, as well as gaseous emissions including carbon monoxide (CO), carbon dioxide (CO_2), nitrogen oxides (NO_X), methane (CH_4), methanol (CH_3OH) and formaldehyde (HCHO), as applicable to the particular vehicle type.

Testing a wide variety of vehicles all across the country

Since it was put into service in 1992, the mobile laboratory has tested hundreds of vehicles in dozens of fleets run by both municipal transit authorities and private companies. Vehicles tested include large trucks, trailers, tractors, urban transit buses, school buses, refuse haulers and snow plows, running on fuels including natural gas, methanol, ethanol, liquefied petroleum gas (LPG), #2 diesel and low sulfur diesel.

Information disseminated to those who need it

In many cases, the data generated through these emissions tests represents new information regarding emerging alternative-fuel vehicle technologies. To ensure that this information is disseminated efficiently and for maximum benefit of fleet operators, it is stored centrally at the Alternative Fuel Data Center (AFDC), where it can be downloaded by qualified parties. Anecdotal information is provided to the National Alternative Fuels Hotline, a voice line established to provide objective information on alternative fuels and vehicles.

For further information, please contact:

Office of Transportation Technologies
U.S. Department of Energy
1000 Independence Avenue, S.W.
Washington, DC 20585
(202) 586-8053

Printed on Recycled Paper

10/94